REMARKS

Claims 1 and 2

Claims 1 and 2 were rejected under 35 U.S.C. §102(e) as being anticipated by Sim et al. (U.S. Patent Number 6,785,212, hereinafter Sim).

Under claim 1 an equalization target is identified for a channel by measuring a goodness metric for first and second candidate targets by reading data through the channel. The measures of goodness metric are compared to each other and the candidate target with the better measure is selected. The selected target is then modified to improve the measure of the goodness metric.

Sim does not show or suggest the invention of claim 1 because it does not modify a selected equalization target to improve the measure of a goodness metric. In the Office Action, column 2, lines 30-49 were cited as showing this step. However, the cited section makes no reference to modifying an equalization target to improve the measure of a goodness metric.

In Sim, an input value is compared to three variables. Based on the difference between the input value and these three variables, one of three sets of branch metrics are selected. Sim does not suggest that by selecting one of these sets of branch metrics, it is modifying an equalization target to improve a measure of a goodness metric. Instead, Sim uses the sets of branch metrics to simplify the construction of the decoder since differences between the input value and the five variables y(ak) do not need to be calculated for the input value. Instead, the difference between the input value and the three variables only needs to be calculated. As such, Sim does not contemplate modifying an equalization target to improve the measure of a

goodness metric. As such, claims 1 and 2 are patentable over Sim.

Claim 3

Claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over Sim in view of McEwen et al. (U.S. Patent Number 6,732,328, hereinafter McEwen).

Claim 3 depends from claim 1 and as such includes the limitation in claim 1 to modifying a selected equalization target to improve the measure of a goodness metric. Neither Sim nor McEwen show this limitation. As such, claim 3 is patentable over the combination of Sim and McEwen.

Claims 5, and 7-10

Claims 5 and 7-10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sim in view of Sawaguchi et al. (U.S. Patent Number 5,539,588, hereinafter Sawaguchi).

Claims 5 and 7-10 are patentable over the combination of Sim and Sawaguchi because none of these references show or suggest selecting one of two candidate targets and then modifying the selected candidate target to improve a measure of a goodness metric.

In addition, claim 7 is further patentable over Sim and Sawaguchi. Under claim 7, the candidate target, which is constrained to have a spectral null, is modified so that it no longer has the spectral null. Neither Sim nor Sawaguchi show this limitation.

In the Office Action, it was asserted that Sawaguchi shows this limitation at column 3, lines 34-52. However, the cited section makes no mention of modifying an equalization

target and specifically does not show modifying an equalization target that has a spectral null to form an equalization target that does not have the spectral null. As such, claim 7 is further patentable over the cited art.

Claims 8, 9 and 10 are also further patentable over the cited references. Under claim 8, the equalization target is modified by sequentially adjusting single terms in the target. Under claim 9, the equalization target is modified by increasing all of the terms in the target at the same time. Under claim 10, the equalization target is modified by sequentially changing pairs of terms. The combination of Sim and Sawaguchi does not show or suggest any of these techniques for modifying the equalization target.

Claims 11 and 12

Claims 11 and 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sim in view of Sridharan et al.("A 110 MHz 350 mW 0.6μ CMOS 16-State Generalized-Target Viterbi Detector for Disk Drive Read Channels", hereinafter Sridharan).

The combination of Sim and Sridharan does not show or suggest the invention of claims 11 or 12. In particular, none of the references count the number of times an equalization target was identified for a head or a head/zone pair and then select the equalization target that was identified for the most heads or head/zone pairs.

In the Office Action, page 367, column 1 of Sridharan was cited to support this rejection. However, the cited section does not mention counting the number of times equalization targets were identified. Instead, the cited section discusses determining equalization target values for each head, where a target value is the read signal that is generated by the head

given a target. Thus, each head has the same target, however, due to fluctuations in the performance of the head, the read signals will differ from head to head. Thus, the cited section does not involve determining equalization targets for a head but instead involve determining expected read signal values given a target. Further, the cited section makes no mention of counting the number of times a target is identified or selecting a target that is identified for the most heads or head/zone pairs. As such, claims 11 and 12 are patentable over Sim and Sridharan.

Claims 15-18

Claims 15-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sim in view of Cideciyan et al. (U.S. Patent Number 6,377,635, hereinafter Cideciyan).

Under claim 15, an equalization target is formed by searching through a plurality of candidate equalization targets that satisfy a spectral null constraint to locate an initial equalization target that provides a best goodness measure. The initial equalization target is then adjusted so that it no longer satisfies the spectral null constraint.

The combination of Sim and Cideciyan does not show or suggest the invention of claim 15. In particular, the combination does not show adjusting an initial equalization target that satisfies a spectral null constraint so that it no longer satisfies the spectral null.

In the Office Action, it was asserted that column 3, lines 23-43 of Cideciyan show this adjustment step. However, the cited section does not mention adjusting an equalization target. Instead, it discusses opitimizing a Viterbi detector given "an arbitrary generalized partial-response target." It does not mention adjusting an initial equalization target that satisfies a

spectral null constraint so that it no longer satisfies the spectral null constraint. It simply discusses how to efficiently calculate a branch metric given an equalization target. There is simply no statement in Cideciyan that it is adjusting a target so that it does not satisfy a spectral null constraint.

Since neither Sim nor Cideciyan adjust a target that satisfies a spectral null constraint so that it does not satisfy the spectral null constraint, the combination of these references does not show or suggest the invention of claims 15-18.

Claims 20 and 21

Claims 20 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sim and Cideciyan as applied to claim 15 above and further in view of Sridharan (note in the Office Action, it is believed the Examiner mistakenly cited Sugawara et al. instead of Sim in making this rejection).

Under claims 20 and 21, a separate equalization target is formed for each head or each head/zone pair. A count of the number of times each equalization target is formed is made. The target that is formed for the most heads or head/zone pairs is selected as the equalization target for the channel.

The combination of cited references does not show or suggest the invention of claims 20 and 21. In particular, none of the references show a step of counting the number of times each equalization target is formed. As such, claims 20 and 21 are patentable over the cited combination.

Claims 22 and 25

Claims 22 and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sim in view of Cideciyan.

Claim 22 provides a method for selecting an equalization target. Under the method, a spectral null constraint is selected. An initial equalization target is then selected from a plurality of targets that satisfy the spectral null constraint. The initial equalization target is then adjusted so that it no longer satisfies the spectral null constraint.

As noted above, neither Sim nor Cideciyan show or suggest adjusting an equalization target that satisfies a spectral null constraint so that it no longer satisfies the spectral null constraint. As such, claim 22 and claim 25 are patentable over the cited combination.

Conclusion

In light of the above remarks, claims 1-3, 5, 7-22 and 25 are patentable over the cited art. Reconsideration and allowance of the claims is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: _____

Theodore M. Magee, Reg. No. 39,758
Suite 1400 - International Centre
900 Second Avenue South
Minneapolis, Minnesota 55402-3319
Phone: (612) 334-3222 Fax: (612) 334-3312

TMM:sew